

**This document summarizes comments received during the Summer 2020 public review period and project team responses for the following draft documents:**

1. Draft Project Overview
2. Draft Terminology
3. Draft Project Inputs and Risk Rating Outputs
4. Draft Design Standards
5. Draft Guidelines and Best Practices

Additional information can also be found on the [“Responses to Questions Received During Stakeholder Outreach”](#) document found on the “Additional Documents and Resources” tab of the beta tool.

## 1. Draft Project Overview

Feedback received	Project team response
It would be helpful to use more bulleted lists in this document (for example in Section 1.3) to help the reader separate and better understand the information.	Addressed in Section 1. Project Overview.
Create “important points to note” section that includes overarching rationale on how the standards work, suggestions for type of information to include in the comment bar.	Incorporated in "Responses to Questions Received During Stakeholder Outreach" found on beta tool.
Clarify at appropriate locations that if municipalities have developed more detailed or localized data/ projections, these can be used for projects within their municipality-including MVP projects	Incorporated in "Responses to Questions Received During Stakeholder Outreach" found on beta tool.
Include hover overs to define key terms within the tool	Incorporated in beta Tool.
Review language to keep it as simplified and user friendly as possible	Final documents reviewed for language accessibility.
FAQ: Revise response on MA Stream Crossing Standards.	Change made to "Responses to Questions Received During Stakeholder Outreach" found on beta tool.
FAQ: Revise response to stormwater green infrastructure design storm.	"Responses to Questions Received During Stakeholder Outreach" clarified that green stormwater infrastructure that is intended or designed for flood mitigation would use the 24-hour storms to evaluate their effectiveness for flood mitigation.
FAQ: Clarify how tool addresses projects that include both natural resources and infrastructure components.	"Responses to Questions Received During Stakeholder Outreach" found on beta tool.

	clarified that Projects that include infrastructure and natural resources will include both assets in the beta Tool. They will be grouped under the same project.
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## 2. Draft Terminology

Feedback received	Project team response
BFE: Revise to incorporate: BFE: FEMA defines the BFE as the computed elevation to which the flood is anticipated to rise during the base flood and specifies that the 1% annual chance flood is the base flood. The BFE is not based on the design storm (because the 1% annual chance storm does not always cause the 1% annual chance flood).	Revised to clarify and used FEMA definition "The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year."
Best practices: Revise definition around "successful activities exemplified in case studies"	Revised in Glossary.
Separate definitions to describe: A confidence interval is a range of values that you can be certain contains the true mean of the population (e.g. 95% confidence interval means you can be 95% certain that a specific range of values contains the true mean. This cuts off the lower and upper tails in a distribution curve). A percentile is a number below which a certain percentage of data fall. You can have a datum be within a 95% confidence interval, and also be in the 97.5th percentile.	Revised in Glossary and will refer to the heat standards as determined from the 50 <sup>th</sup> and 90 <sup>th</sup> percentiles, not confidence intervals.
Criticality: This definition isn't clear. Redefine to incorporate the following, along with calling out scope/time/severity: "A concept assessing how important an asset is based on the consequences of its failure, expressed along a continuum (e.g. low to high)."	Revised in Glossary to add "Score that expresses the consequences of failure of an asset as a function of scope, time, and severity. Criticality is an internal metric in the RMA Tool and is expressed as low, medium, and high."
FIRM: Perhaps add that FIRMs are based on historic climate patterns	Revised in Glossary to add "based on historic information".
Flood Protection: Revise to say that it can also include measures to mitigate vulnerability to flooding, rather than exposure.	Revised in Glossary.
Define geographic area and population affected	Incorporated in Glossary.
Add the terms "simulation frequency" and "hydrodynamic".	"Simulation Frequency" and "Hydrodynamic" added to Glossary. Also revised definitions for the following terms: Projects; Best Practices; Flood Protection; Planning Horizon; Severity; Standards; Storm Damage Prevention; Basin Scale.

### 3. Draft Project Inputs and Risk Rating Outputs

Feedback received	Project team response
<b>Feedback on Exposure Questions</b>	
Need further testing on exposure ratings, questions seems like it will be difficult to produce "moderate" exposure .	Exposure questions and resulting scores and thresholds were revised. Please refer to Section 2: Project Inputs and Climate Risk Screening Output for additional details.
Add Maybe and Unknown to Exposure Inputs that are Yes/No. The systems should function when inputs are not known or known yet.	Exposure question responses revised to "Yes, No, Unsure" options.
Prior flooding question is too simplistic as yes/no. Revise to include options for reasons/extent/mitigation for flooding in order to assign points (i.e. is the flooding from a broken pipe, site grading, sea level rise?)	Prior flooding question updated to clarify that flooding is not based on past water/sewer damages.
Consider question on proximity to water bodies, wetlands, and impervious surface composition in the site vicinity	Proximity to water bodies already incorporated in GIS layer to inform precipitation and heat exposure.
Increase the "Extreme Precipitation" scores assigned to sites with a history of flooding during extreme precipitation events from 2 to 3. Consider weighting actual records of flooding on site more highly.	The score assigned to projects with a history of flooding during extreme precipitation events was increased to 3 for urban flooding. Please refer to Section 2: Project Inputs and Climate Risk Screening Output for additional details.
Why not ask the converse questions as well? Does the project result in a decrease of impervious area? Does the project result in decreased flooding? Will the project lower flood levels? This would help to initially screen out projects that will have a benefit toward climate change impacts.	Ecosystem Services Benefits score added to project outputs to flag projects to provide environmental benefits to the site.
For the extreme heat parameter, should consider including a question/filter about existing tree canopy cover	Exposure question added that refers to whether trees are being removed as part of the project; yes answer increases exposure score.
Reconsider asking about the proximity of waterbodies. Waterbodies can provide cooling in the daytime, but they can be reservoirs of heat and raise evening temperatures. What might be more useful are questions about the existing amount of shade on a site. If the project finds that extreme heat is a low risk based on current site conditions, but the project involves removing trees and their canopy, then the UHI effect may increase.	Exposure question added that refers to whether trees are being removed as part of the project; yes answer increases exposure score.
Consider asking whether the site is in an existing urban heat island	Noted for future revised version of beta Tool, when data layer is available

	statewide through MAPC project currently in scoping phase.
<b>Feedback on Asset Questions</b>	
Comments that questions are too subjective, and users may not know the public/social impacts of project inoperability.	Question language vetted with state agency focus groups and revised to improve objectivity and clarity.
Comments on the need to increase clarity/guidance on questions related to impacts on vulnerable populations	Question added on impacts to environmental justice and climate vulnerable populations, including hover over text and link to MA Environmental Justice GIS layer in beta Tool.
Are evacuation routes a GIS layer that can be connected?	Noted for future revised version of beta Tool.
Consider incorporating protection of plants and "improves heat island effect" or simply "provides shade"	"Protection of fisheries, wildlife, and plant habitat" added within Ecosystem Services Benefits questions.
Concerns for how the asset questions and exposure ratings function for natural resource assets, that are meant to result in positive changes to the environment. For example, if a project that is within the floodplain or coastal zone results in positive change to these areas it seems that it will inherently be High Risk (e.g., dam removal, culvert replacement, coastal wetland restoration).	Framework revised for Natural Resource asset types and reviewed by Natural Resources working group. Asset questions and risk rating removed for Natural Resource project types. "Ecosystem Services Benefits (ESB) Score" added as an output to replace risk rating. This output will be for whole project, not just asset specific, to reflect on overall benefits for natural resources associated with a project. ESB Score will be "High" "Medium" and "Low" and use additive points framework as described in Section 2: Project Inputs and Climate Risk Screening Output for additional details.
There are approximately 3,000 dams in Massachusetts. Only 43 are designed and managed as flood control dams. It seems inappropriate to classify all dams into the flood control category as the vast majority provide little to no flood control benefit. Most dams are referred to as run-of-river dams.	"Flood Control" asset type revised to "Dams and Flood Control Structures"

## 4. Draft Design Standards

Feedback received	Project team response
<p>This section states that if the project meets the criteria that trigger Tier 3 methodology, “a technical peer review is recommended to review the calculation package.”</p> <p>Please add that an in-depth stakeholder and community engagement session and social vulnerability assessment is also recommended to be conducted.</p>	<p>Incorporated into guidelines.</p>
<p>Please provide documentation for how return periods were determined and why return periods for precipitation differ from SLR/storm surge.</p> <ul style="list-style-type: none"> <li>Clarify if the recommendation is for the time of planning or at the end of the design life? Under what scenario?</li> <li>Clarify why the recommended return periods for utilities differ than the recommended return periods for transportation?</li> </ul>	<p>See Section 2: Project Inputs and Climate Risk Screening Output document for explanation of return period and planning horizon recommendations. RCP8.5 scenario is utilized.</p> <p>Transportation &amp; solid/hazardous waste in general have higher return period recommendations that align with current recommendations (ex. 1000-yr storm events).</p>
<p>There appears to be an inconsistency in BFE data between Table 3.4 and Table 3.5 in Section 3.2 (Joe Moakley Park example). In Table 3.4, BCB elevations 18.4, 18.9, 19.3 correspond to the 25- (4%), 50- (2%), and 100-yr (1%) AEP recurrence events. In Table 3.5, these same elevations correspond to the 50- (2%), 100- (1%) , and 1000-yr (0.5%) AEP recurrence, respectively. Please clarify, or state any design or rounding assumptions.</p>	<p>Elevations in tables reviewed and revised.</p>
<p>The methodology for all Tiers only provides 24hr rainfall depths and approach for hyetograph generation.</p>	<p>Limitation in current scope. Noted for future iteration of beta Tool.</p>
<p>Comments regarding the applicability of recommended standards to natural resource asset types .</p>	<p>Multiple updates made to improve how the tool functions for natural resource projects, including:</p> <ul style="list-style-type: none"> <li>Tier recommendations will no longer linked be to criticality <ul style="list-style-type: none"> <li>Projects with less than 10 years useful life (regular maintenance) will recommend Tier 1 - low level of effort.</li> <li>Projects with greater than 10 years useful life will recommend Tier 2 – moderate level of effort.</li> <li>All projects are welcome to use Tier 3 methods if desired.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Return Periods recommendations are no longer linked to criticality <ul style="list-style-type: none"> <li>○ Recommended return periods will not be provided, only recommended planning horizons. Standards will guide users to use existing return period recommendations/standards with future planning horizons</li> </ul> </li> <li>• Design criteria for extreme heat would only apply for open space and urban forest asset types.</li> <li>• Design criteria for coastal would only apply for coastal resource area asset types.</li> <li>• Design criteria for extreme precipitation would apply for all natural resource types with the exception of coastal resource areas.</li> </ul>
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## 5. Draft Guidelines and Best Practices

Feedback received	Project team response
Questions should emphasize not only protecting important parcels of land but also that natural resources, particularly trees and other native vegetation, should be avoided and impacts minimized as much as possible within project designs. If there are existing degraded areas on the site that are barren, compacted, or dominated by invasive plant species, and these area will not be part of the built project, then the design should incorporate restoration of these areas with native trees and other native plants.	Climate Resilience Design Guidelines document updated to reflect comments.
Suggest reviewing SITES Rating System goals	Climate Resilience Design Guidelines document updated to highlight review rating systems such as LEED, SITES, SAGE, and ENVISION to overall guidelines.
Expand Regional Coordinator guideline to provide more guidance on designing with/for vulnerable populations for project managers/ engineers. .	Additional text and references included in RC-4, including: <ul style="list-style-type: none"> <li>• BRIC Community Lifelines framework</li> <li>• NJ 2020 Seat at the Table recommendations.</li> <li>• Providence RI Climate Justice Action Plan</li> <li>• US Sustainability Director’s Guide to Equitable Community-driven Climate Preparedness report</li> <li>• Building Blue – Framework for a Healthy Charles</li> </ul>
Suggest PMs reach outside of their sector... consideration of the CRB principle to include stakeholders from each of the community components of infrastructure-environment-society.	Recommendation included in Regional Coordination Guidelines in Climate Resilience Design Guidelines.
<u>Providence, Rhode Island</u> is a great example of a Climate Justice Action Plan. Also include: <u>US Sustainability Director’s Guide to Equitable Community-driven Climate Preparedness report</u>	References included.



#### Feedback received to consider for future beta Tool iteration

- Add a climate exposure filter/question related to erosion on site
- Add a climate exposure filter/question related to proximity to wetlands and surrounding site impervious surfaces
- Examine additional climate exposure sources for extreme precipitation data (Wing et. al 2017) and how it could be incorporated into Tool (currently only using existing available GIS layers)
- Develop more GIS filters for Heat for climate exposure (tree canopy, urban heat island via Trust for Public Land)
- Add GIS filter on Evacuation routes
- Add a methodology for extreme precipitation for rainfall events less than 24 hours
- Examine additional sources for extreme precipitation data (Wing et. al 2017) and how it could be incorporated into Standards for riverine criterion recommendations